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HARPIN IS NOT NECESSARY FOR THE PATHOGENICITY OF *ERWINIA STEWARTII* ON MAIZE.

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Erwinia stewartii elicits a hypersensitive response (HR) in tobacco if expression of the *hrp*-like *wts* regulon is enhanced. A clone containing *E. amylovora* $hrpN_{Ea}$ was used as a hybridization probe to locate a gene for harpin production, $hrpN_{Es}$, within the *wts* gene cluster. Transposon mutagenesis and complementation analysis revealed that $hrpN_{Es}$ is a monocistronic operon. Sequence analysis indicated that it encodes a 382-amino acid, glycine-rich polypeptide, which lacks cysteine and an N-terminal signal peptide. $Harpin_{Es}$ is 58% identical and 78% homologous to $harpin_{Ea}$, and 41% identical and 66% homologous to $harpin_{Ech}$ from *E. chrysanthemi*. Purified $harpin_{Es}$ was protease sensitive and heat-stable, and it elicited a typical HR in tobacco leaves. Antibodies to $harpin_{Es}$ cross-reacted with $harpin_{Ea}$, and conversely. $Harpin_{Es}$ was found in cytoplasmic, membrane, and extracellular fractions. Chromosomal mutations in $hrpN_{Es}$ were constructed by Tn*5* mutagenesis and marker-exchange. The mutants were HR- and did not produce detectable harpin in Western blots. However, they remained fully pathogenic on maize seedlings with respect to symptom severity, ED_{50} and response time, and they grew as well as the wild-type strain *in planta*. Likewise, loss of harpin did not affect the ability of a $hrpN_{Es}$ mutant to grow endophytically in several grasses. *wtsB*, *wtsD*, and *wtsF* mutants accumulated $Harpin_{Es}$ intracellularly, indicating that these DNA regions are necessary for harpin secretion.

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